REMARKS

Claims 1-4, 11-14 and 21 are all the claims pending in the application; claims 1-3, 11-14 and 21 are rejected; claim 4 is allowed.

After entry of the amendment, claims 1-4, 11, 13-14 and 22 will be pending.

The claims have been amended to more fully comply with U.S. format and to more clearly state that which Applicants regard as their invention. In addition, the following specific amendments have been made.

Claims 1 and 11 have been amended to recite "wherein said polypeptide has activity at pH 2.5 to 3." Support for this amendment may be found at page 47, line 25 through page 48, line 1, of the specification. These claims have also been amended to more fully describe the disaccharide glycosides upon which the polypeptides of the claims have activity (those having a glucose moiety at the aglycon side). Support for this amendment may be found at page 6, lines 21-22, where it is disclosed that the disaccharide glycosides upon which the polypeptides of the present invention have activity are those having glucose on the aglycon side. These claims have further been amended to recite the specific microorganisms from which the polypeptides may be isolated. Support for this amendment may be found at page 12, lines 12-18.

Claim 2 has been amended to recite specific disaccharide glycosides. Support for the amendment may be found in the specification at page 76, last paragraph.

Claim 3 has been amended to recite the percent homology with SEQ ID NO:8. Support for the amendment may be found at page 16, lines 12-17.

Support for new claim 22 may be found at page 54, lines 8-9.

No new matter has been added. Entry of the amendment is respectfully requested.

I. Claim Rejections - 35 U.S.C. § 112, Second Paragraph

At page 2 of the Office Action, paragraph 2, claims 1-3 and 11-14 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

A. Regarding the recitation of "analogous disaccharide glycoside" in claim 2, the Examiner maintains the position that the scope of "analogous" is unclear, as set forth in the previous Office Action.

In response, Applicants include herewith an amendment to claim 2 such that specific disaccharide glycosides are now recited in the claim. Support for the amendment may be found in the specification at page 76, last paragraph.

In view of the amendment to the claim, Applicants assert that claim 2 is definite as written and therefore respectfully request reconsideration and withdrawal of this rejection.

B. Regarding claims 1-2 and 11-14, the Examiner asserts that the recitation of "a substantial activity" is indefinite because of lack of a definition of the term "substantial."

In response, Applicants include herewith an amendment to claims 1 and 11 deleting the term "substantial."

In view of the amendment to the claims, Applicants assert that claims 1 and 11 are definite as written and therefore respectfully request reconsideration and withdrawal of this rejection.

II. Claim Rejections - 35 U.S.C. § 112, First Paragraph

A. At page 3 of the Office Action, paragraph 3, claims 1, 2 and 11-14 are rejected under 35 U.S.C. § 112, first paragraph, as lacking adequate written description support in the specification.

The Examiner indicates that this is a new matter rejection. The Examiner states that although the limitation of "stable at 50°C or less" is supported by Applicants' specification (page 50, line 2), the limitation of "has a substantial activity even at a pH 3 or less" is not supported by original specification, claims or figures of the present application.

In response, Applicants included herewith an amendment to the claims such that the phrase "wherein said polypeptide has a substantial activity even at a pH 3 or less" has been canceled from the claims.

In place of the noted phrase, the claims now recite "wherein said polypeptide has activity at pH 2.5 to 3." Support for this amendment may be found at page 47, line 25 through page 48, line 1, where it is stated that for the diglycosidase derived from *Aspergillus fumigatus*, "its optimum pH was from 2.5 to 3.0."

In view of the amendment to the claims, Applicants assert that cited claims have adequate written description support, and therefore respectfully request reconsideration and withdrawal of this rejection.

B. At page 4 of the Office Action, paragraph 4, claims 1-3 and 11-14 are rejected under 35 U.S.C. §112, first paragraph, as lacking adequate written description support.

The Examiner states that the polypeptides recited in claims 3 and 21 are not limited to a particular substrate or to those relevant identifying characteristics of pH and temperature tolerance as recited in claims 1 and 11.

The Examiner also asserts that the only two species of enzymes or polypeptides disclosed in the specification are both isolated from a single microorganism, and are not representative species of the genus of enzymes and polypeptides as presently claimed.

The Examiner further asserts that the relevant identifying characteristics of having activity at pH 3 or less and stability at 50°C or less are insufficient to describe the structures of recited genus.

In response, Applicants include herewith a number of amendments to the claims, with the result that the amended claims have adequate written description support in the specification.

For example, the claims now recite a well defined group of polypeptides, with well defined features. Each of the polypeptides recited in the rejected claims has a specific activity ("act upon a disaccharide glycoside to thereby release saccharides from said disaccharide glycoside in a disaccharide unit), and act upon a small group of disaccharide glycosides ("wherein said disaccharide glycoside has a glucose moiety at the aglycon side"). Each of the polypeptides recited in the rejected claims has specific physical properties, including activity at a low pH (2.5 to 3) and a stability at high temperatures of up to 50°C. Each of the polypeptides recited in the rejected claims is isolated from a defined source ("the genus *Aspergillus*, the genus *Penicillium*, the genus *Rhizopus*, the genus *Rhizomucor*, the genus *Talaromyces*, the genus *Mortierella*, the genus *Cryptococcus*, the genus *Microbacterium*, the genus *Corynebacterium* and the genus *Actinoplanes*").

Furthermore, the polypeptide variants recited in claim 3 (please note that claim 21 has been canceled) are also well defined based on homology to SEQ ID NO:8 ("at least 50%), and the functional and specific physical properties recited in claim 1.

Method claim 11 has also been amended to incorporate each of these elements as well.

Therefore, Applicants assert that the recited genus of polypeptides is adequately defined in the specification, and the skilled artisan would easily be able to recognize the identity of members of the genus and that Applicants were in possession of the claimed invention.

Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

C. At page 6 of the Office Action, paragraph 5, claims 1-3, 11-14 and 21 are rejected under 35 U.S.C. § 112, first paragraph, as being non-enabled.

The Examiner maintains the rejection as to the enzymes, polypeptides, and microorganisms for the reasons set forth in the previous Office Action. Briefly, the Examiner states that Applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including *all* diglycosidases, methods of producing diglycosidases by culturing *any* microorganism in a nutrient medium that contains *any* substance that induces production of an enzyme having diglycosidases activity.

In response, Applicants refer to the comments above concerning the amendment of the claims under **II. B.**, and incorporate them herein. In view of the amendments, and in contrast to the Examiner's position, the claims do not recite *all* diglycosidases. The diglycosidases recited in the claims are limited to a small group based on activity, physical properties and source.

Similarly, the method claims do not recited methods of producing diglycosidases by culturing *any* microorganism in a nutrient medium that contains *any* substance that induces production of an enzyme having diglycosidases activity. Instead, the claims recite a defined group of microorganisms (see claim 11), and a defined substance ("saccharide").

In view of the amendments to the claims, and the points discussed above, Applicants assert that the claims are fully enabled and therefore respectfully request reconsideration and withdrawal of this rejection.

III. Claim Rejections - 35 U.S.C. §102/103

A. At page 8 of the Office Action, paragraph 8, the rejection of claims 1, 3 and 11-13 under 35 U.S.C. §102(b), as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over McCormack et al., has been maintained.

The Examiner states that McCormack et al. teaches a method of producing an enzyme having chitobiase activity by culturing a *Talaromyces* species, and that McCormack et al. further teaches isolating the enzyme by centrifuging the cells and collecting the supernatant comprising the enzyme for further analysis.

The Examiner also states that chitin used in McCormack et al. is considered a glycoside by various sources.

In response, Applicants include herewith an amendment to the claims such that the claims recite a polypeptide with an activity to act upon a disaccharide glycoside "wherein said disaccharide glycoside has a glucose moiety at the aglycon side." Thus, the polypeptides of the present application have a specific enzymatic activity. As described in Examples 12 and 14 of the specification, a disaccharide (primeveroside) and an aglycon are released by allowing the diglycosidase of the present application to act on eugenylprimeveroside as a substrate. Example 16 reveals a similar result when a diglycosidase of the present application acts on other disaccharide glycosides as substrates.

In contrast, chitinase is an enzyme which acts on chitin, which is a polysaccharide. While chitin may be considered to be a glycoside, cleavage of chitin with chitinase does not produce an aglycon (the non-saccharide) while a diacetylchitobiose (a disaccharide) is released. Accordingly, the enzyme disclosed in McCormack et al. is quite different from that of the present application.

Thus, there is no disclosure in McCormack et al. of a polypeptide with the same activity. As chitin is not a disaccharide glycoside that has a glucose moiety at the aglycon side of the disaccharide glycoside, the chitobiase of McCormack et al. cannot be said to be a polypeptide with the same activity as the polypeptides of the instant application.

Furthermore, the polypeptide of McCormack et al. does not make obvious the polypeptides of the present invention. There is no indication in McCormack et al. that the polypeptide taught therein would be expected to have a broad substrate range such that it would also recognize and cleave the bond between an aglycon and a saccharide chain, as recited for the polypeptides of the pending claims.

In view of the absence of any teaching or suggestion in McCormack et al. of a polypeptide having the activity recited in the claims of the present application, Applicants assert that McCormack et al. does not teach or suggest the present invention and therefore respectfully request reconsideration and withdrawal of this rejection.

B. At page 9 of the Office Action, paragraph 9, the rejection of claim 3 under 35 U.S.C. §103(a) as being unpatentable over Harman et al., has been maintained.

The Examiner states that Harman et al. teaches an enzyme isolated from *Trichoderma harzianum* stain P1 having chitobiase activity.

In response, Applicants refer to their arguments above concerning the rejection of the claims over McCormack et al. and incorporate them herein.

As with McCormack et al., Harman et al. does not teach or suggest a polypeptide with the same activity as the polypeptides of the present invention. The polypeptide of Harman et al. has chitobiase activity, and the recited activity of the polypeptides of the present invention is one that recognizes and cleave the bond between an aglycon and a saccharide chain. As chitin is not a disaccharide glycoside that has a glucose moiety at the aglycon side of the disaccharide glycoside, the chitobiase of Harman et al. cannot be said to be a polypeptide with the same activity as the polypeptides of the instant application.

Further, there is no suggestion in Harman et al. that the polypeptide taught therein would have the ability to also recognize and cleave the bond between an aglycon and a saccharide chain, as recited for the polypeptides of the present invention.

In view of the absence of any teaching or suggestion in Harman et al. of a polypeptide having the activity recited in the claims of the present application, Applicants assert that Harman et al. does not teach or suggest the present invention and therefore respectfully request reconsideration and withdrawal of this rejection.

IV. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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